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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,499	01/22/2002	Jin-Yuan Lee	MEGP0012USA	7456
27765 7590 06/13/2007 NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION P.O. BOX 506 MERRIFIELD, VA 22116			EXAMINER THAI, LUAN C	
			ART UNIT 2891	PAPER NUMBER
			NOTIFICATION DATE 06/13/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/055,499

Applicant(s)

LEE ET AL.

Examiner

Luan Thai

Art Unit

2891

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 281-370 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 281-370 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1/22/08 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restriction

Applicant's election with traverse of the Embodiment I of figures 1A-1I, which reads on claims 281-370 on 3/22/07, is acknowledged. The traversal is on the ground(s) that the claimed passive devices shown in Figs. 6, 7, 9A-9B, 10A-10B, and 11A-11C bay be simultaneously formed during fabricating a chip package using one of the five embodiments. The traverse is found persuasive but the examiner still maintains the difference between pieces for the reasons stated in the previous Office Action mailed 2/23/07. The applicant is noted that pending claims (281-370) are method claims and the processes of fabricating circuit components (e.g., Species 1-5 as recited the Restriction Requirement mailed February 23, 2007) are different from one another as specified in Applicant's Specification, paragraphs [0041]+, [0046]+, [0051]+, and [0064]+.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 281, 287, 288, and 291, 294-296, are rejected under 35 U.S.C. 102(b) as being anticipated by Eichelberger (6,159,767 of record).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 281, 287, 288, and 291, 294-296, Eichelberger (see specifically figures 1-2 and 5-9) discloses a method for fabricating a circuit component comprising: joining a plurality of dies (102) having conductive pads (107) on a top surface; forming a film layer (104) of polymer (Col. 16, lines 24+) over the substrate (140) and around the die (102), wherein the layer (104) has a surface coplanar with an active surface of the die (102); forming and curing an insulating layer (106) of polymer (Col. 4, lines 54+ and Col. 14, lines 1+) comprising a first portion over the die and a second portion over the substrate but not over the dies (140) (Figs. 5e-5f); depositing a circuit layer (110, see Fig. 5f) by sputtering (Col. 11, lines 3+) over the dies and across an edge of the die (102); depositing solder bumps (152/154/160) over the circuit layer, wherein at the bump (152/154) can be positioned over the substrate but not over the dies (see figures 5g-5h) and comprises solder or gold (Col. 11, lines 35+). Eichelberger further discloses an electronic component (220) over the horizontal level. Since Eichelberger defines chips (102) are “*active IC chips*” (Col. 12, line 2, line 11, and line 15+), the *electronic component* (220), which connects to the active chips (102), is considered as a passive device (not active device).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject

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matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 300 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eichelberger (6,159,767 hereinafter "Eic-767" of record) in view of Marcinkiewicz (6,025,995 of record).

Regarding claim 300, "Eic-767" discloses the claimed invention as detailed above except for separating the substrate into multiple portions.

Marcinkiewicz while related to a similar method teaches (see specifically figures 6-7) the steps of fabricating simultaneously a plurality of circuit components (16) on the substrate (14) and then separating the substrate into multiple portions in order to form a plurality of individual component. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify "Eic-767" method accordingly in order to product the circuit components in mass production; thus, to reduce the manufacture cost, and such modification is held to be within the ordinary designing ability expected of a person skilled in the art.

5. Claims 282-283, 289-290, 292-293, 297-298, 301-312, 314-323, 324-328, and 330-331, are rejected under 35 U.S.C. 103(a) as being unpatentable over Eichelberger (6,159,767 hereinafter "Eic-767" of record) in view of Marcinkiewicz (6,025,995 of record) and further in view of Wojnarowski et al. (5,576,517 of record).

Regarding claims 282, 301, 304, 305, 308-310, 314, and 317-319, the proposed method of Eichelberger and Marcinkiewicz discloses the claimed invention as detailed above except for the insulating layer comprising a porous structure.

Wojnarowski et al. while related to a similar structure design teach (see specifically figures 1-11) teach an insulating layer (20) comprising a porous structure being deposited over the die (14) (Col. 5, lines 9+), which is mounted on the substrate (10). The purpose of using the

insulating layer comprised a porous structure is to reduce the dielectric constant of the insulating layer (as close to 1 as possible and not greater than about 2, Col. 3, lines 30+) so that it can reduce the need for laser ablation of material situated over air bridge structures and other microwave structures and devices (Col. 3, lines 45+). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize that applying the low dielectric constant porous layer, as taught by Wojnarowski et al., to the proposed Eichelberger and Wojnarowski method would have been beneficial because Wojnarowski et al.'s teachings help to provide a low dielectric constant insulating layer which can apply to form high frequency circuits and reduce the need for laser ablation of material situated over air bridge structures and other microwave structures and devices.

Regarding claims 283, 292-293, 302-303, 306-307, 320-621, 324-326, and 330-331, although the proposed method as described above lacks an inclusion of the use of electroplating or electroless-plating to form the circuit layer, selecting a specific type of known available plating process, as evidenced by Konrad (U.S. Patent No. 6,730,857, Col. 4, lines 15+), in semiconductor art, for forming a circuit layer would have been obvious to one of ordinary skill in the art. It would have been obvious to modify the proposed method (as described above) accordingly in order to form the circuit layer since such plating processes are well known in the art and that modification is held to be within the ordinary designing ability expected of a person skilled in the art. The further citation in claims 289-290, 297-298, 311-312, 315-316, 322-323, and 327-328, regarding grinding or etching the polymer layer would have been obvious for similar reasons set forth above.

6. Claims 284-286, 332-343, 345-355, 357-367, and 369-370, are rejected under 35 U.S.C. 103(a) as being unpatentable over Eichelberger (6,159,767 of record), Marcinkiewicz (6,025,995 of record) and Wojnarowski et al. (5,576,517 of record) as applied to claim 283 and further in view of Saia et al. (5,874,770 of record).

Regarding claims 284-286, 332-343, 345-355, 357-367, and 369-370, the proposed method of Eichelberger, Marcinkiewicz and Wojnarowski discloses the claimed invention, including the claimed passive device, as detailed above but lacks an inclusion of passive device being a capacitor, a resistor, an inductor, a filter, a waveguide, or a micro electronic mechanical sensor.

Saia while related to a similar method teach (see figures 1-12) passive devices (e.g., capacitor 37, resistor 28, and inductor 33) being part of the circuit layers and both of which are formed over and electrical connected to the die (44). Although the proposed method, as described above, lacks an inclusion of passive device being a capacitor, a resistor, an inductor, a filter, a waveguide, or a micro electronic mechanical sensor, selecting a specific type of a passive device, such as capacitor, resistor, inductor, filter, waveguide, or micro electronic mechanical sensor for a circuit component for providing a component with a specific intended function would have been obvious to one of ordinary skill in the art. It would have been obvious to modify the proposed method Eichelberger, Marcinkiewicz and Wojnarowski accordingly for providing a component with a specific intended function, and such modification is held to be within the ordinary designing ability expected of a person skilled in the art since the component having passive device,

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which comprises a capacitor, a resistor, a inductor, etc., are commonly disclosed in the art.

7. Claims 299, 313, and 329, are rejected under 35 U.S.C. 103(a) as being unpatentable over Eichelberger (6,159,767 of record), Marcinkiewicz (6,025,995 of record), Wojnarowski et al. (5,576,517 of record) as applied to claims 281-283 and further in view of Tseng (6,395,580).

Regarding claims 299, 313, and 329, the proposed method of Eichelberger, Marcinkiewicz and Wojnarowski discloses the claimed invention, including the claimed adhesive for joining the die to the substrate, as detailed above but lacks an inclusion of the adhesive comprising a conductive paste.

Conductive paste, however, is commonly applied in the art for bonding the die or chip to a substrate or carrier, as disclosed by Tseng (Col. 6, lines 61+). Although the proposed method of Eichelberger, Marcinkiewicz and Wojnarowski does not specify the adhesive comprising a conductive paste, selecting a specific type of known available adhesive material as disclosed by Tseng, in semiconductor art, for providing a thermal bonding between the die and the substrate would have been obvious to one of ordinary skill in the art. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the conductive paste for joining the die to the substrate since such conductive paste is commonly applied in the art as disclosed by Tseng and that application is held to be within the ordinary designing ability expected of a person skilled in the art.

8. Claims 344, 356, and 368, are rejected under 35 U.S.C. 103(a) as being unpatentable over Eichelberger (6,159,767 of record), Marcinkiewicz (6,025,995 of record), Wojnarowski et al.

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(5,576,517 of record) and Saia et al. (5,874,770 of record), as applied to claims 284-286 and further in view of Tseng (6,395,580).

Regarding claims 344, 356, and 368, the proposed method of Eichelberger, Marcinkiewicz, Wojnarowski and Saia, discloses the claimed invention, including the claimed adhesive for joining the die to the substrate, as detailed above but lacks an inclusion of the adhesive comprising a conductive paste.

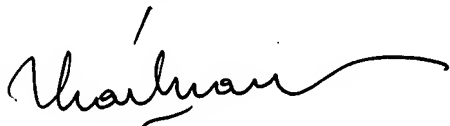
Conductive paste, however, is commonly applied in the art for bonding the die or chip to a substrate or carrier, as disclosed by Tseng (Col. 6, lines 61+). Although the proposed method of Eichelberger, Marcinkiewicz, Wojnarowski and Saia does not specify the adhesive comprising a conductive paste, selecting a specific type of known available adhesive material as disclosed by Tseng, in semiconductor art, for providing a thermal bonding between the die and the substrate would have been obvious to one of ordinary skill in the art. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the conductive paste for joining the die to the substrate since such conductive paste is commonly applied in the art as disclosed by Tseng and that application is held to be within the ordinary designing ability expected of a person skilled in the art.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan Thai whose telephone number is 571-272-1935. The examiner can normally be reached on 8:00 AM - 4:30 PM, Monday to Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley W. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Luan Thai', with a long, sweeping horizontal flourish extending to the right.

Luan Thai

Primary Examiner

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June 6, 2007